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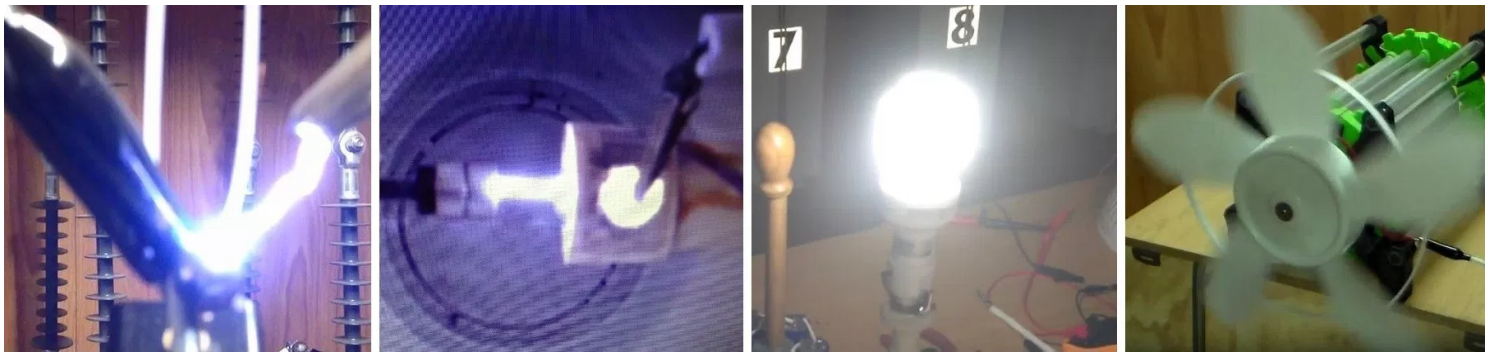
DOCUMENTARY REPORT ABOUT IONPOWERGROUP COM V1 5 fi...

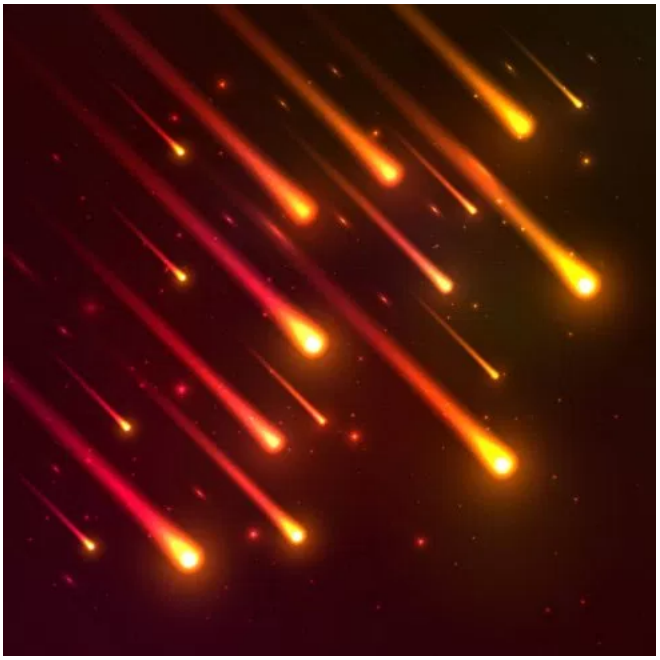
Highly energetic **G**alactic **C**osmic **R**ays (GCRs) arriving from deep space impact Mars' atmosphere on a consistent basis creating electrically charged ions throughout the atmosphere.

Carbon/graphite nanomaterials have been shown to be effective at harvesting electricity from atmospheric ions on Earth. Likewise, it is anticipated that carbon nanomaterials elevated into the Martian atmosphere can also harvest electricity from Mars' ion-rich atmosphere day and night and particularly during dust storms.

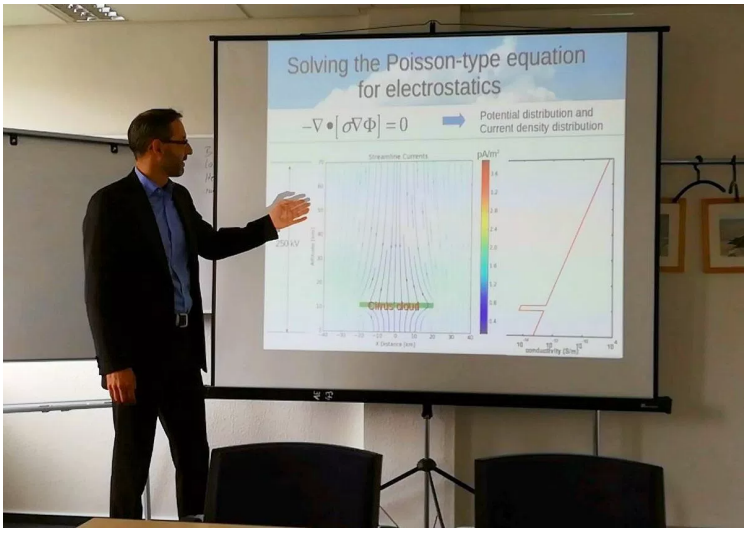


On Earth, experiments have demonstrated that high voltage electricity harvested from airborne ions can power lights, motors or produce hydrogen & oxygen gas via water electrolysis or place a charge on lithium-iron (LiFePO4) batteries and be converted to 120VAC/60hZ 'house style' current. Mars has an ion-rich atmosphere believed to be even more advantageous for Ion Harvesting Technology. See 'Concept Clips' for videos.

GCRs penetrate deeply into Mars' thin atmosphere as depicted below.

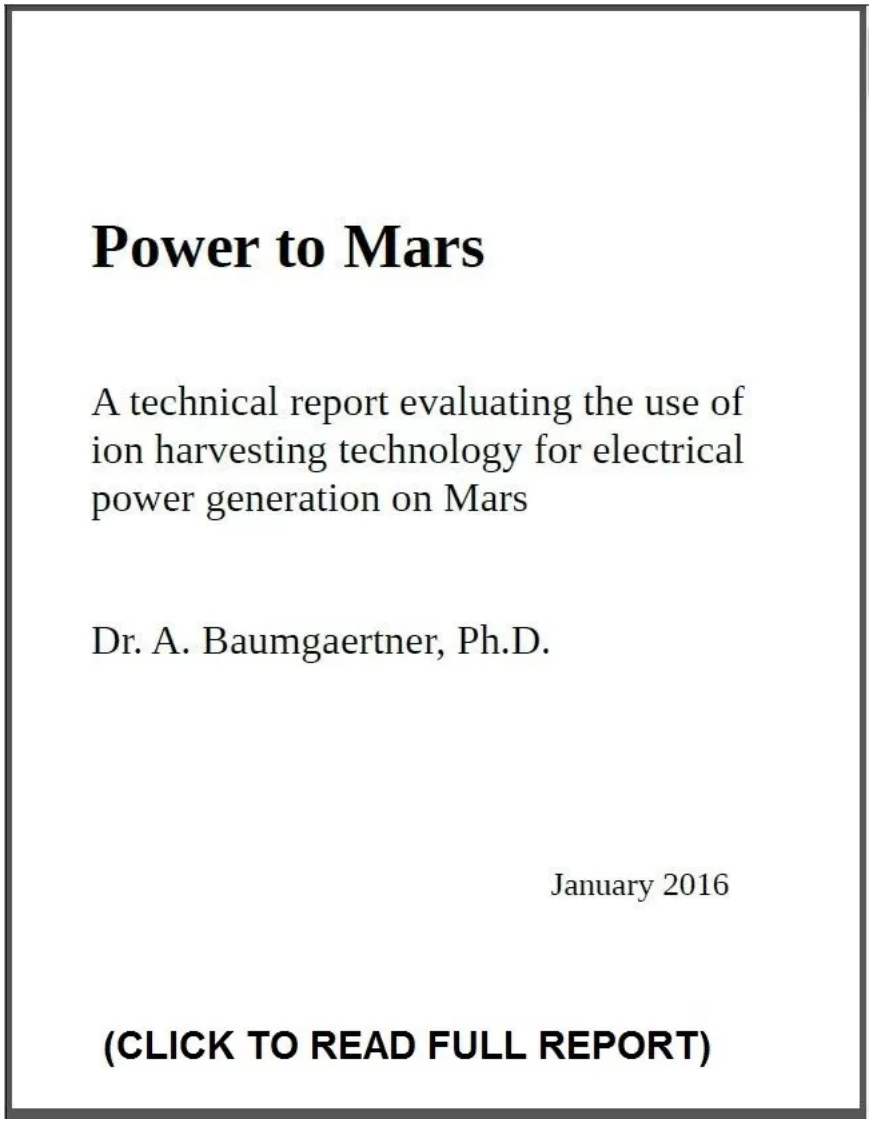


On February 10th 2016, Senior Scientist of Atmospheric Physics Dr. Andreas J .G. Baumgaertner PhD published a technical report titled 'Power to Mars'. To read the report, click the below Power To Mars report image or read it on Zenodo by clicking here (https://zenodo.org/record/1045600#.Wgm41Bte6Uk). The report recommends that ion harvesting technology be combined with solar panels to provide reliable power day and night for future Mars missions. With a theoretical power generation duty-cycle approaching 99% ion harvesting technology is designed to continue to produce electricity during conditions that cause solar panels to fail such as nighttime and dust storms.



Dr. Andreas J. G. Baumgaertner PhD • Atmospheric Physicist, Senior Scientist – German Aerospace Center • Author of POWER TO MARS

(https://zenodo.org/record/1045600#.Wgm41Bte6Uk)



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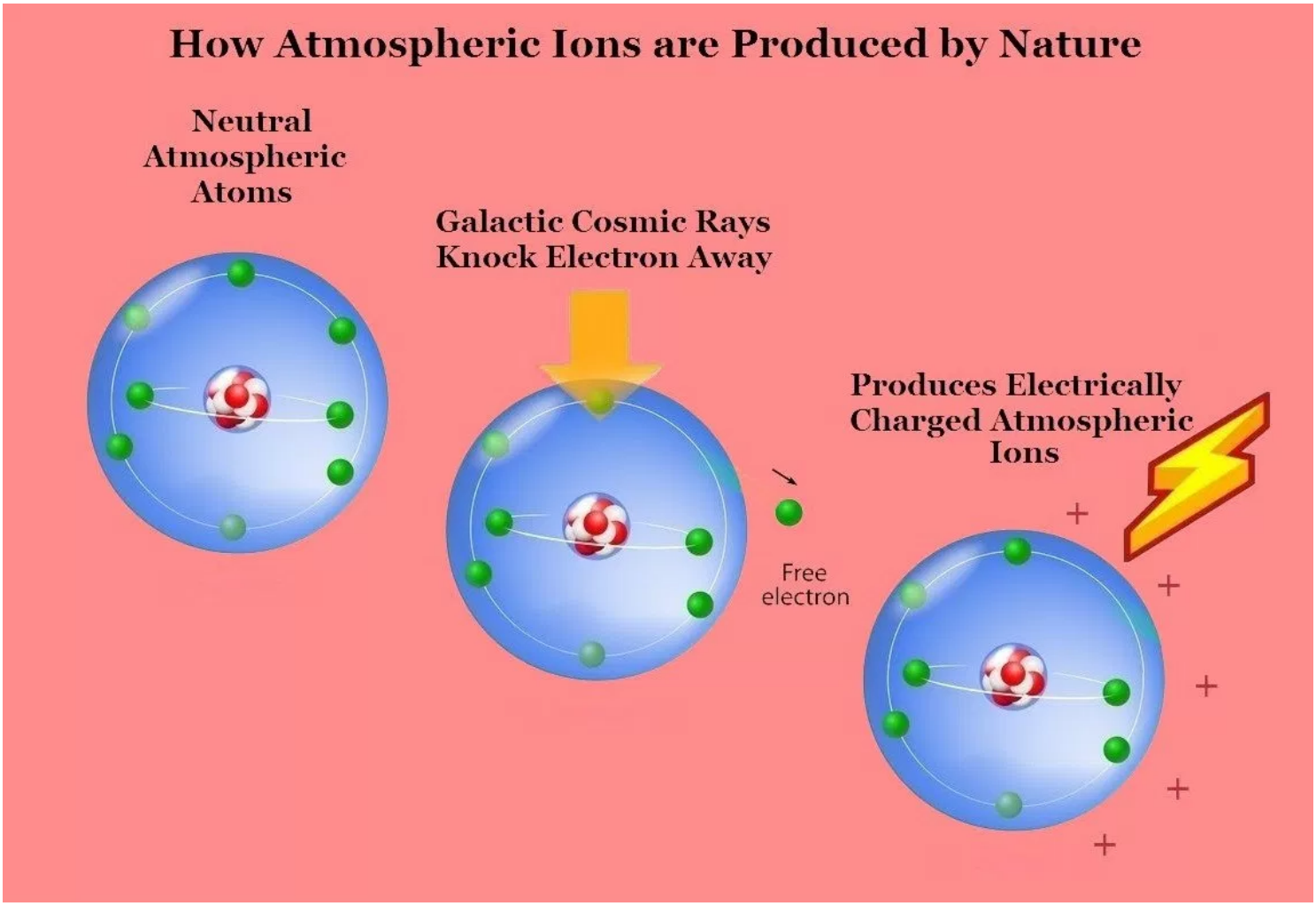
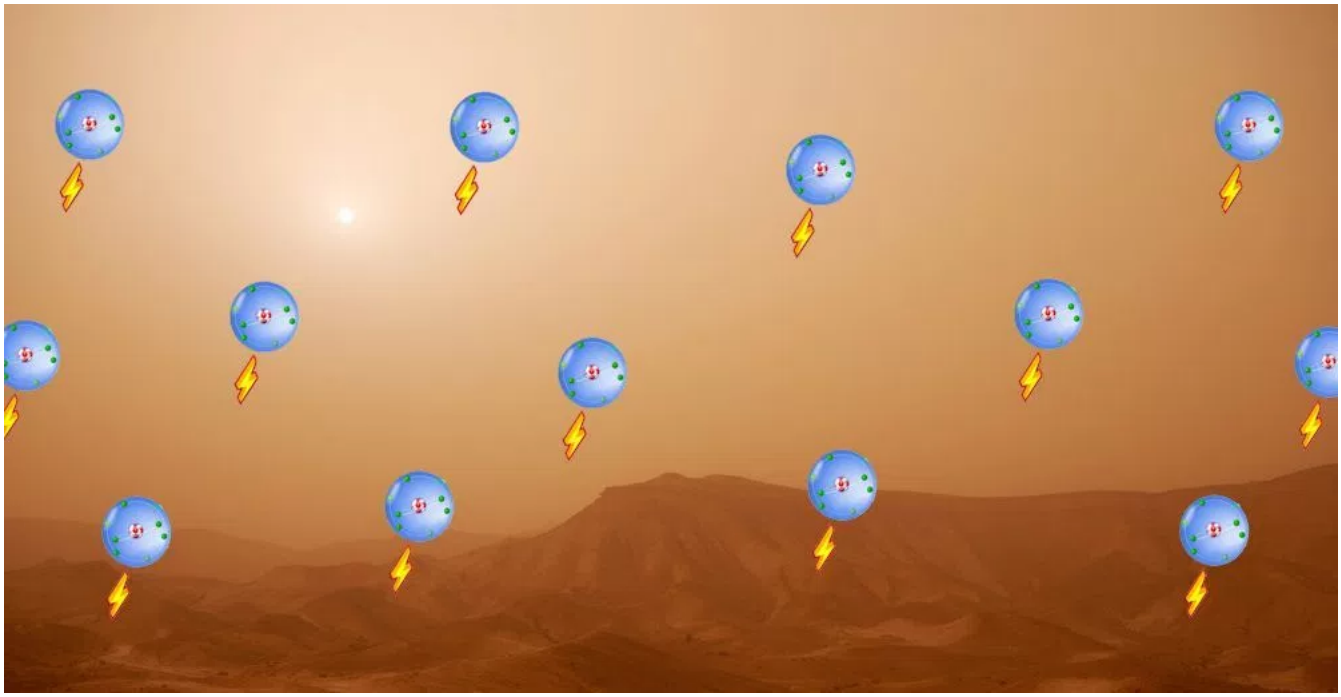
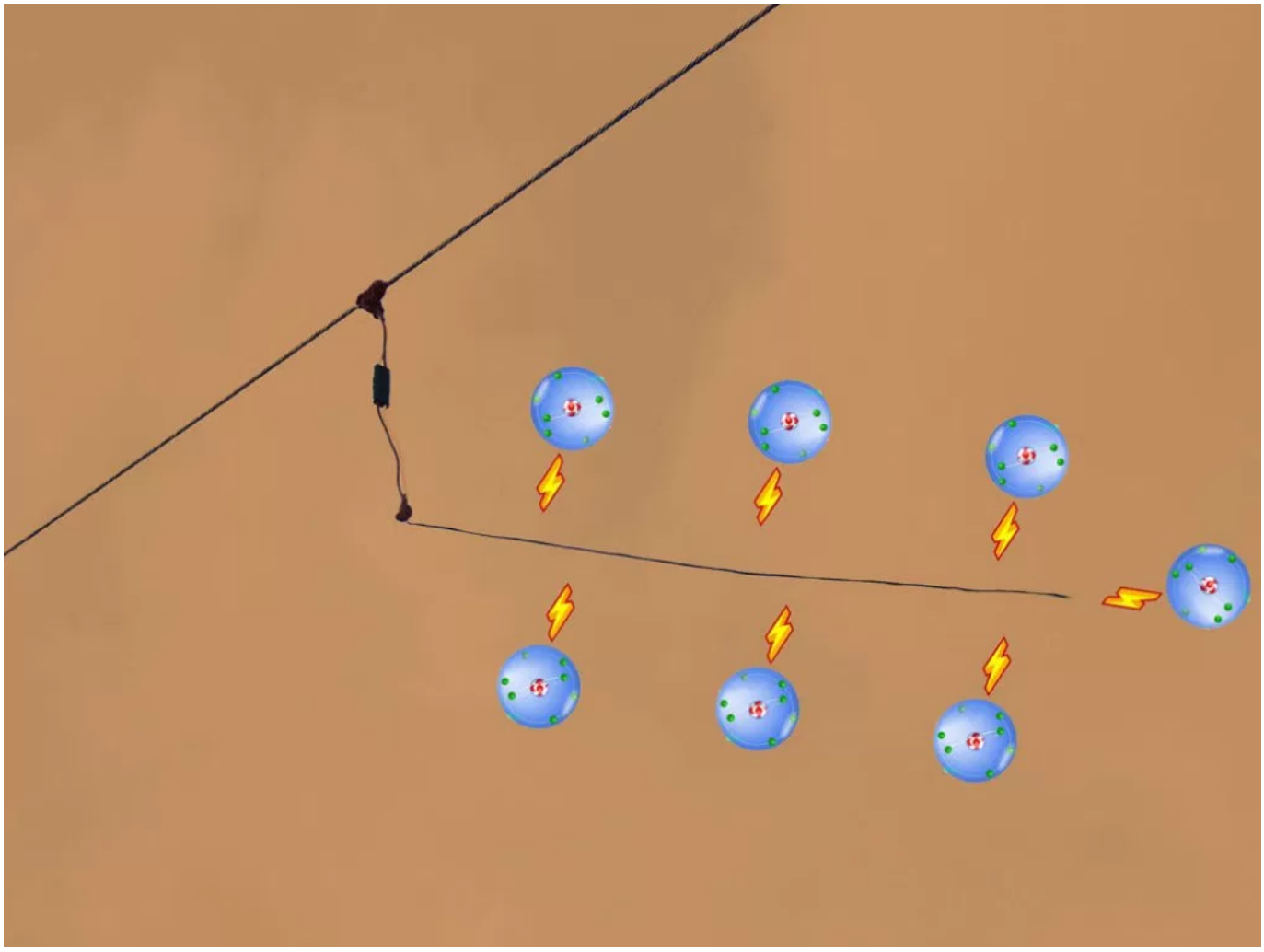
GCRs (which are actually microscopic particles traveling at enormous velocity) arriving from deep space impact neutral atoms in the Martian atmosphere knocking electron(s) away producing electrically charged atoms known as ions. Each of the billions of microscopic atmospheric ions acts as a charge carrier conveying a high voltage electric charge. The production of atmospheric ions is a natural process occurring day and night across the entire planet of Mars.



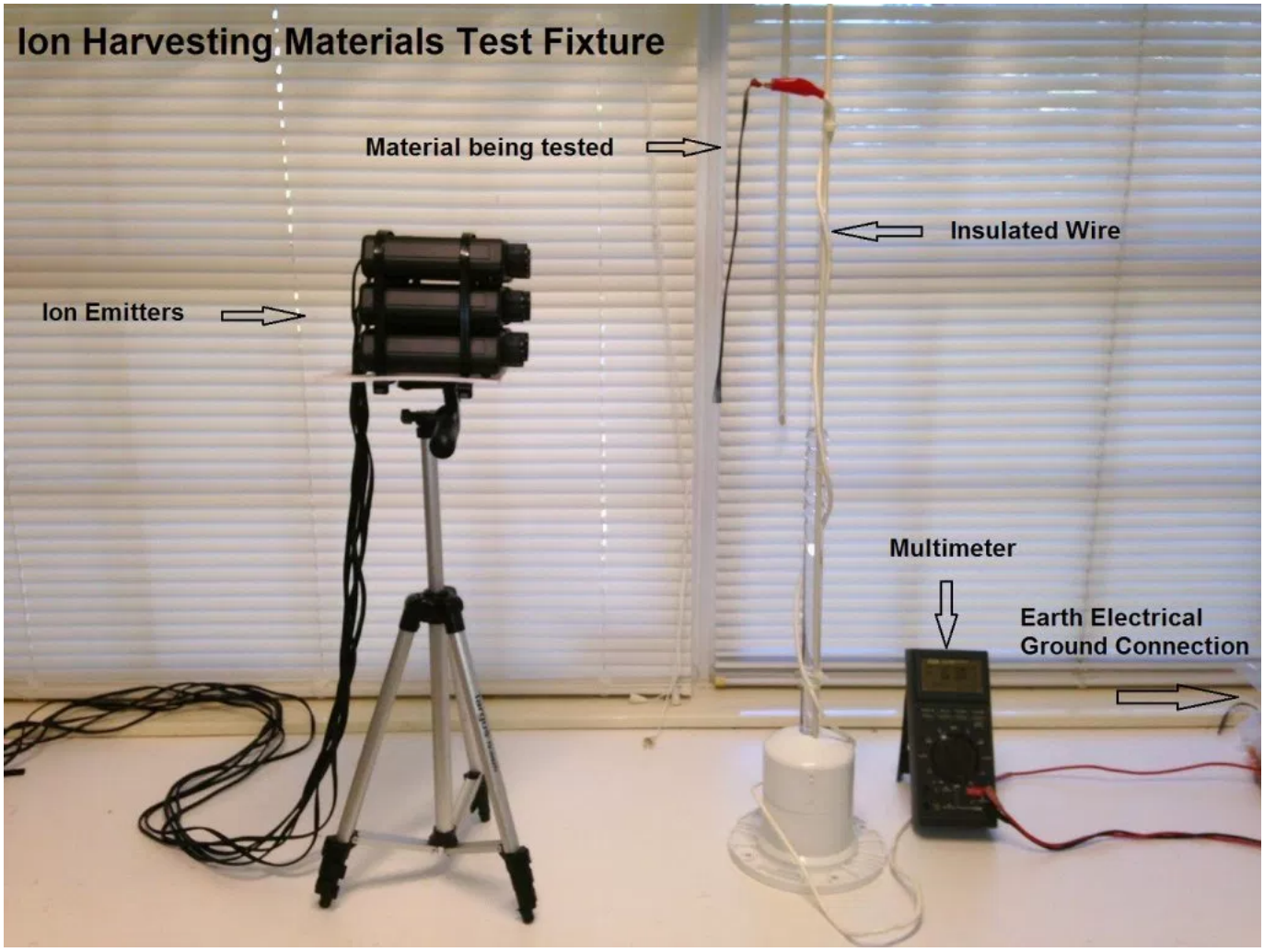
Dust storms occurring on Mars generate strong electrical fields that propagate throughout the Martian atmosphere conveyed by the ions constantly present in the atmosphere. Dust storms can cover large regions of the planet blotting out the sun and can persist for days or weeks. Because the ion-filled Martian atmosphere is electrically conductive, electricity generated by remote dust storms elsewhere on the planet is permitted to propagate throughout the Martian atmosphere. NASA Scientist, Michael Smith, who works at the NASA Goddard Space Flight Center told Space.com "***The dust is electrostatic, like foam peanuts.***" In an interview with NewScientist.com, Brian Jackson with the Physics Department at Boise State University says ***"It's possible that all of the dust grains clattering together in these storms could produce a lot of electricity..."*** interview seen here (https://www.newscientist.com/article/2143217-marss-surface-hosts-millions-of-towering-dust-devils-every-day/).



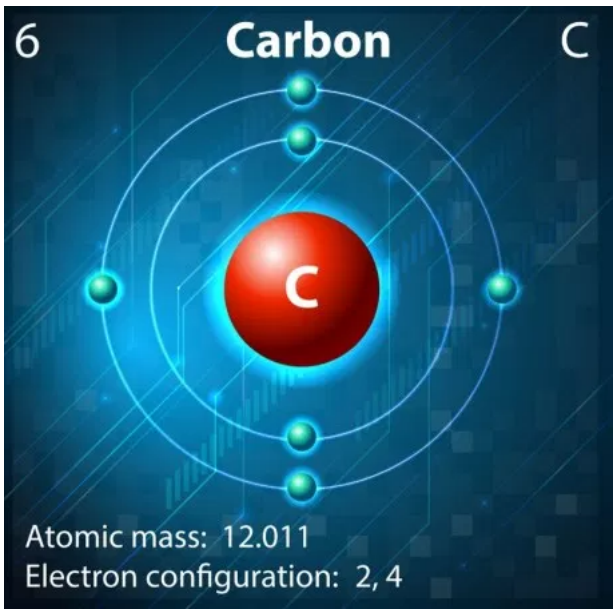
Ion Power Group's ion collectors, elevated in the Martian atmosphere by tall poles or specially designed aerial platforms (balloons), are designed to harvest the electric charge conveyed by near-Mars ions to produce clean renewable high-voltage electricity day and night and during dust storms as depicted below.

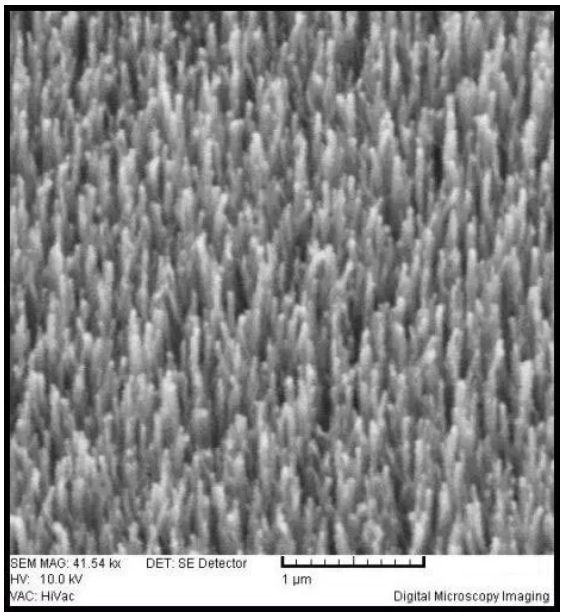


Ion collectors composed of Graphite and/or Graphene, while not metalic, are electrically conductive, flexible and durable. Electric fields are attracted to conductive points, known as the 'Corona Effect'. Ion collectors offer millions of microscopic electrically conductive points and protrusions which readily couple to the electric fields of nearby ions transferring high voltage electricity from the atmospheric ions to the ion collectors. Measurements have shown that ion collectors made of graphite are more efficient at harvesting electricity from airborne ions than tested metals. In some tests, by as much as 55x greater efficiency. Some of the tested metals include highly conductive silver, copper, and aluminum wire – aluminum spheres – copper and aluminum sheets.



Below is a picture of carbon, a key component of ion collectors, taken at the microscopic level by an electron microscope.

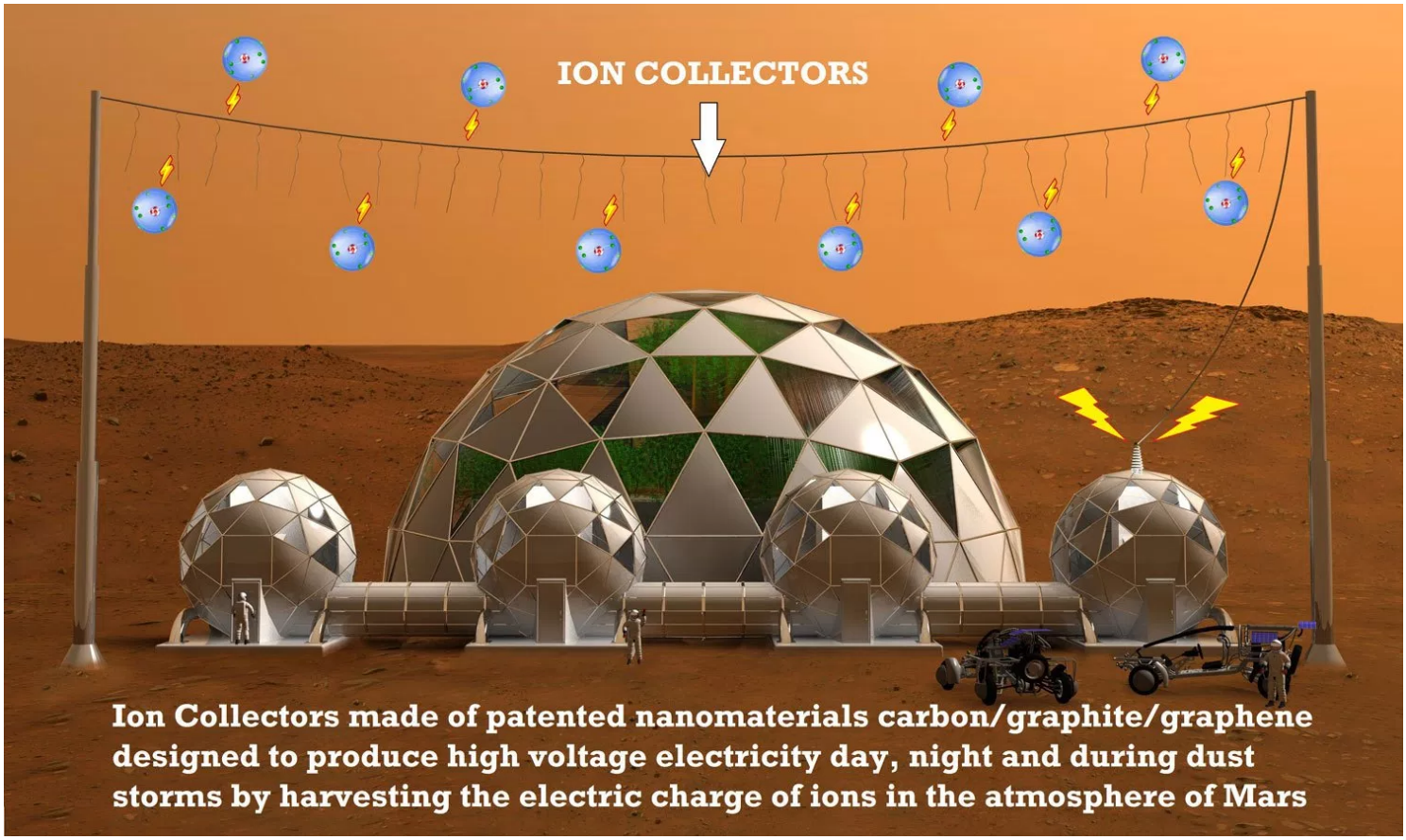




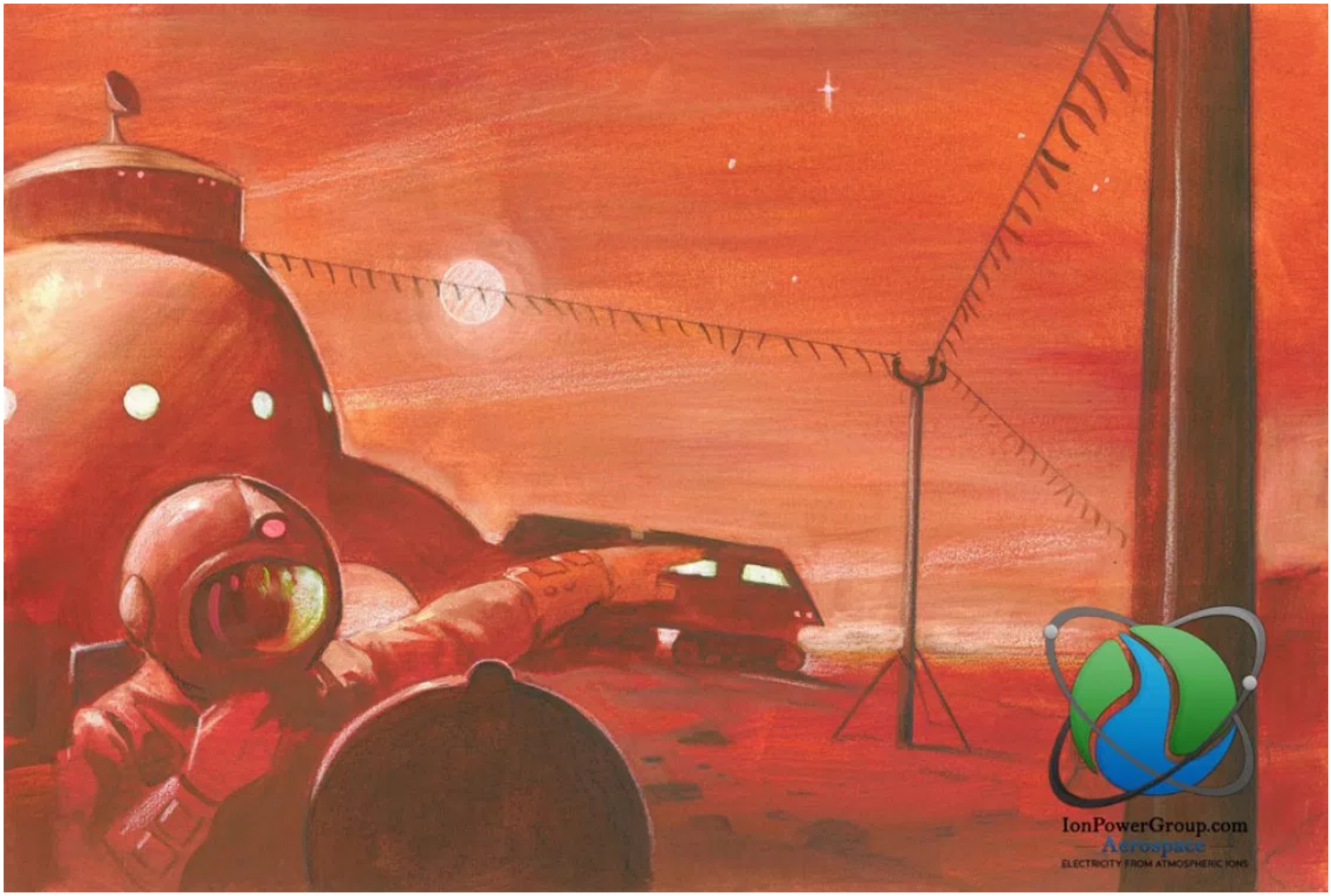
Ion Power Group's internationally patented ion collectors, elevated between two poles in the below depiction, are specially designed to couple to the energetic electrically charged ions in the Martian atmosphere. Ion collectors are designed to harvest the high voltage DC electric charge from naturally occurring atmospheric ions day and night and during dust storms and are not dependent on sun or wind. Ground based circuitry has been designed to maintain the ion collector material at a voltage considerably lower than the surrounding atmospheric ions thereby employing the electrostatic attraction principle causing nearby ions to migrate to the ion collectors. Wires will convey the harvested electricity to the base camp where it is routed to a storage medium (such as super capacitors, graphene batteries, lithium-ion batteries, hydrogen gas fuel cells) to be used for life support, light, heat, the production of oxygen for breathing and rocket fuel (hydrogen) from Martian water, communications, fisheries, agriculture and transportation.

Artists rendering of a tethered aerostat providing altitude for graphite nanofibers to harvest electricity from ions in the Martian atmosphere day and night. The harvested electricity is conveyed down the conductive tether for use on the ground.

Below is a genuine image of Mars' surface. Superimposed is an artist's image of Ion Power Group's ion collectors (thin black material dangling between the two poles) providing electrical power to a conceptual Mars base camp similar to those planned by governments, private and corporate aerospace organizations. Long duration aerial platforms (tethered balloons) may also be used to provide altitude to lightweight ion collectors.



"Solar power… cannot be used at night and during dust storms. It has been shown (in the Power to Mars technical report) that ion power and solar power can be combined to provide a reliable and safe power generation concept." **PhD Atmospheric Physicist and Senior Scientist with the German Aerospace Center, Dr. Andreas J .G. Baumgaertner**



The conditions on Mars including a weak magnetic field, frequent dust storms around the planet and constant bombardment of the Martian atmosphere by GCRs provide an ideal electrical environment for Ion Power Group technology to harvest the electric charge of naturally occurring atmospheric ions to produce reliable, environmentally friendly, electrical power without reliance on sunlight, wind, nuclear or fossil fuels. The highly ionized Martian atmosphere will provide an extremely fertile electrical environment for Ion Power Group's technology to generate clean renewable pollution-free electrical energy day and night and during dust storms. The ability of ion harvesting to generate electricity day/night/dust storms will prove valuable to power robots, rovers, drones, vehicles, living quarters, lights, communications, entertainment equipment, heat to melt Martian ice for drinking, trenchers for extracting water from soil, water for agriculture and fisheries as well as producing hydrogen gas to use for rocket fuel and oxygen for breathing through electrolysis of Martian water.

Nearly 100 countries have some level of space program. A growing number of governments, as well as many private and corporate organizations, are developing plans to send robots and hardware to be followed by people to colonize Mars in the foreseeable future. All of these campaigns will require a reliable source of electrical power on the surface of Mars.

Additional information regarding Ion Harvesting Technology's Principle-of-Operation can be found on the page titled "How it works on Earth. (/how-it-works-on-earth/)

The survival of humans on Mars requires that the settlers have access to reliable electrical power production, day and night and during the lengthy dust-storms known to occur on Mars. Ion Power Group believes that ion harvesting is the long term solution.